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PICO MACOM®

PFAM550

550MHz Agile A/V Modulator

Installation and Operation Manual

PICO MACOM®
A STEREN COMPANY

Ph: 800-421-6511 **www.picomacom.com**

Operation
Manual
Rev. 07/03

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Product Inspection

Inspect the equipment for shipping damage. Should any damage be discovered, immediately file a claim with the carrier.

Important Safety Instructions

To insure proper installation and operation, take a moment to read this guide before proceeding with the installation. If you have any questions or comments about the **PFAM550** Agile A/V Modulator, please contact your dealer or have him contact the **PICO MACOM** Service Center at these phone numbers: 800-421-6511, 818-493-4300.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: **TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY.**

CAUTION: **TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.**

ATTENCION: **POUR PREVENIR LES CHOCS ELECTRIQUES, NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.**

1. Read Instructions: All safety and operating instructions should be read before the appliance is operated.

2. Retain Instructions: The safety and operating instructions should be retained for future reference.

3. Heed Warnings: All warnings on the appliance should be adhered to.

4. Follow Instructions: All operating and user instructions should be followed.

5. Cleaning: Unplug this appliance from the wall outlet before cleaning. Use a damp cloth for cleaning. Do not use liquid cleaners or aerosol cleansers.

6. Do Not Use Attachments: Use of attachments not recommended by the manufacturer may cause hazards.

7. Water and Moisture: Do not use this product near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool—and the like.

8. Accessories: Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the appliance.

9. Ventilation: This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to. Any slots or opening in the cabinet are provided for ventilation. To ensure reliable operation of the video product and to protect it from overheating, these openings must not be blocked or covered. Openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface.

10. Grounding or Polarization: This video product is equipped with either a three prong plug for 110 VAC use or a two prong flat blade 220 volt type plug. Each type is to be inserted into only the type of receptacle for which they specifically designed. Do not cut off the round grounding pin in order to be able to fit into a two prong receptacle as this could cause injury and will void the warranty.

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11. Power Sources: This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied to your home, consult your appliance dealer or local power company.

12. Power-cord Protection: Power-supply cords should be routed so they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.

13. Lightning: For added protection for this product during a lightning storm, or when it is left unattended or unused for long periods of time, the unit should be disconnected from power source.

14. Power Lines: An outside antenna system should not be located in the vicinity of overhead power lines, other electric light or power circuits, where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them may be fatal.

15. Overloading: Do not overload wall outlets and extension cords as this can result in risk of fire or electric shock.

16. Object and Liquid Entry: Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

17. Servicing: Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

18. Damage Requiring Service: Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power-supply cord or plug is damaged.

b. If liquid has been spilled, or objects have fallen into the product.

c. If the product has been exposed to rain or water.

d. If the product does not operate normally by following the operating instruction. Adjust only those controls that are covered by the operating instructions. An improper adjustment may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.

e. If the product has been dropped or the cabinet has been damaged.

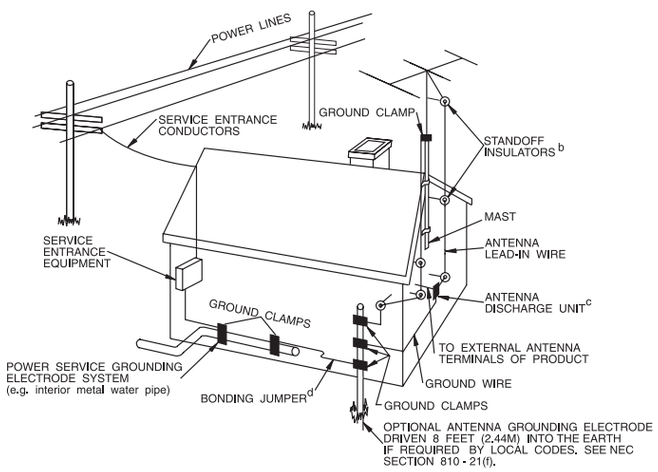
f. When the product exhibits a distinct change in performance—this indicates a need for service.

19. Replacement Parts: When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original parts. Unauthorized substitutes may result in fire, electric shock or other hazards.

20. Safety Check: Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating conditions.

21. Outdoor Antenna Grounding: Before attempting to install this product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges.

EXAMPLE OF ANTENNA GROUNDING ACCORDING TO NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810 - "RADIO AND TELEVISION EQUIPMENT"


POWER LINES
SERVICE ENTRANCE CONDUCTORS
GROUND CLAMP
STANDOFF INSULATORS b
MAST
ANTENNA LEAD-IN WIRE
SERVICE ENTRANCE EQUIPMENT
ANTENNA DISCHARGE UNIT c
GROUND CLAMPS
TO EXTERNAL ANTENNA TERMINALS OF PRODUCT
POWER SERVICE GROUNDING ELECTRODE SYSTEM (e.g. interior metal water pipe)
GROUND WIRE
BONDING JUMPER d
GROUND CLAMPS
OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44M) INTO THE EARTH IF REQUIRED BY LOCAL CODES. SEE NEC SECTION 810 - 21(f).

a. Use No.10 AWG (5.3mm) copper, No.8 AWG (8.4mm) aluminum, No.7 AWG (10mm) copper-clad steel or bronze wire or larger, as ground wire.

b. Secure antenna lead-in and ground wires to house with standoff insulators spaced from 4 feet (1.22m) to 6 feet (1.83m) apart.

c. Mount antenna discharge unit as close as possible to where lead-in enters house.

d. A driven rod may be used as the grounding electrode where other types of electrode systems do not exist. Refer to the National Electrical Code, ANSI/NFPA 70-1984 for information.

e. Use jumper wire not smaller than No.6 AWG (13.3mm) copper or equivalent, when a separate antenna grounding electrode is used.

NOTE TO THE CATV SYSTEM INSTALLER

THIS REMINDER IS PROVIDED TO CALL THE CATV SYSTEM INSTALLER'S ATTENTION TO ARTICLE 820-22 OF THE NEC THAT PROVIDES GUIDELINES FOR PROPER GROUNDING AND, IN PARTICULAR, SPECIFIES THAT THE CABLE GROUND SHALL BE CONNECTED TO THE GROUNDING SYSTEM OF THE BUILDING, AS CLOSE TO THE POINT OF CABLE ENTRY AS PRACTICAL.

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PFAM550

550MHz Agile A/V Modulator

- *82-Channel frequency range 54-550 MHz (CATV 2-78, 95-99)*
- *DIP switch controlled phase-locked loop for solid drift-free output on any channel*
- *SAW filtered for superior adjacent channel performance enables drop-in channel expansion*
- *57dBmV output for optimum carrier-to-noise performance*
- *Carrier-to-noise ratio >60dB provides superior picture quality*
- *Front panel test point for easy RF level system monitoring*
- *Composite audio-video IF loop provides compatibility with encoders, ghost cancellers, and video-override applications*
- *IRC and HRC offset available for frequency settings in systems using offset channels*
- *Double heterodyne conversion provides superior spurious harmonic output suppression*
- *UL Approved*

PFAM550

550MHz Agile A/V Modulator

The **PFAM550** is a professional re-broadcast grade frequency agile double heterodyne conversion audio/video modulator. Its SAW filter provides superior sideband filtering, adjacent channel compatibility and spurious free output. The **PFAM550** provides 57±2 dBmV output over 82 channels from CATV channel 2 to 78 accommodating HRC and IRC offset frequencies. The unit features a composite audio-video IF loop, which provides compatibility with encoders, ghost cancellers, and video-override applications. Front panel DIP-switch controlled phase-locked-loop (PLL) allows easy channel selection and drift-free channel stability. High quality modulation and RF level control potentiometers assure years of reliable operation. The modulator is shipped with all internal adjustments pre set, and FCC Docket 21006 offsets are standard. **Pico Macom** backs up this product with its industry leading 5-year limited warranty.

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Specifications

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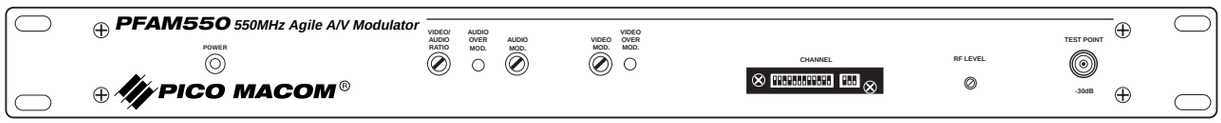
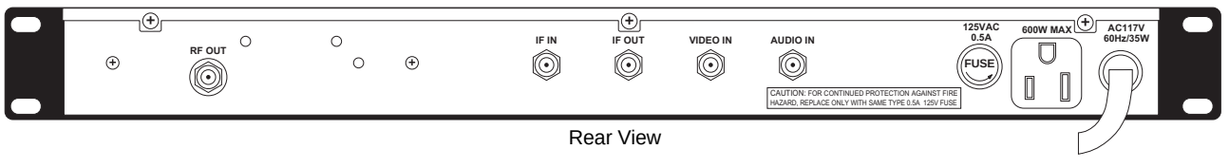
550MHz Agile A/V Modulator



Front View



Rear View

RF

Video Channels:	82 channels (2-78 & 95-99)
Frequency Range:	54-550 MHz
Output Level:	45 to 57 dBmV, ± 2 dBmV (adjustable from front panel)
Output Impedance:	75 ohms
Output Return Loss:	-15 dB
Audio/Video Ratio:	Adjustable -7 to -22 dB below visual carrier
Frequency Stability:	±5 kHz in aeronautical band Conforms to FCC Docket 21006
Spurious Output:	-60 dB below video carrier with A/V ratio @ -15 dB
C/N (In-band):	>57 dB
C/N (Out-of-Band):	>68 dB
Fv+6 MHz (Upper Adj. Reject):	>60 dBc
Fv-1.5 MHz (Lower Adj. Reject):	60 dBc

Audio

Baseband Input Impedance:	600 ohms unbalanced
Baseband Input Level:	0.5 V p-p for 25 kHz peak dev.
Pre-emphasis:	75 microseconds
Flatness:	1.5 dB max. 50 Hz to 15 kHz

Video

Input Level:	1.0 V p-p min for 87.5% mod.
Input Type:	Clamped video neg. sync
Video S/N:	-60 dB minimum (weighted)
Input Level Range:	0.5 V to 1.5 V p-p
Frequency Response:	±0.8 dB 30 Hz to 4.2 MHz
Differential Gain:	<5% (10 to 90% APL)
Differential Phase:	<5° (10 to 90% APL)
Chrominance luminance delay:	*See note below
Hum and Noise:	-60 dB @ 87.5 modulation

***NOTE**: Meets FCC group delay predistortion requirements for color transmission.

General

Power Input:	95 to 130 VAC, 60 Hz or 210-250 VAC, 50 Hz
Operating Temperature:	-10° C to + 50° C
Dimensions:	19˝(L) x 9 3/8˝(D) x 1 3/4˝(H)
Weight:	3.8 lbs.
Connectors:	All “F” type

Ordering Information

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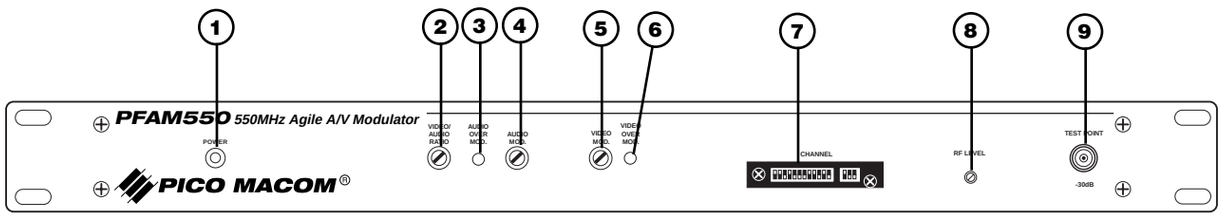
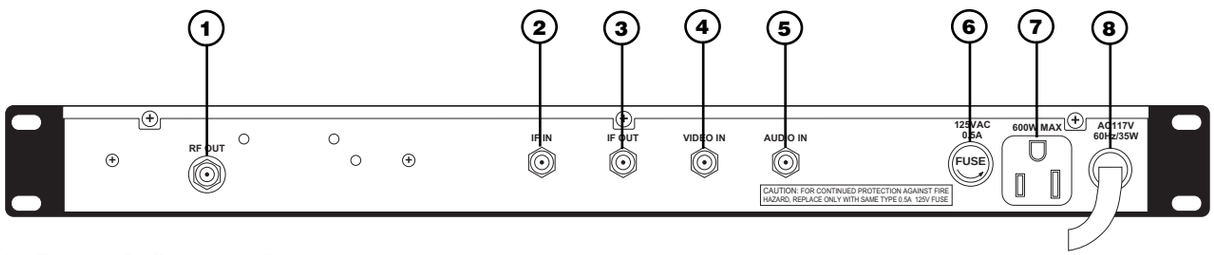


Front Panel Control

1. **Power On LED:**
   Indicates power is on when lit.
2. **Video/Audio Ratio Adjustment:**
   Used to set level of audio carrier.
3. **Audio Modulation LED:**
   Indicates aural over modulation level when lit.
4. **Audio Modulation Adjustment:**
   Used to set audio modulation (Volume).
5. **Video Modulation Adjustment:**
   Used to set video modulation.
6. **Video Modulation LED:**
   Indicates video over-modulation when lit.
7. **Channel Select:**
   Dip switches are used to select desired channel.
8. **RF Output Adjust:**
   Used to set output level.
9. **-30dB Output Test Monitor:**
   Used to monitor RF output level.



Back Panel Control

1. **RF Output:**
   Connect this port to distribution system.
2. **I.F. Input:**
   Input from I.F. scrambler or I.F. output.
3. **I.F.Output:**
   To I.F. input or to scrambling device.
4. **Video Input:**
   Accepts video output from satellite receiver, VCR and CCTV camera.
5. **Audio Input:**
   Accepts audio output from satellite receiver, VCR and CCTV camera.
6. **Fuse holder:**
   117VAC type - 0.5 amp, 125V slow-blow fuse.
   220VAC type - 0.5 amp, 250V slow-blow fuse.
7. **Convenience Outlet:**
   117VAC type
8. **Power Cord:**
   117VAC type - Three wire, standard U.S.A. type.

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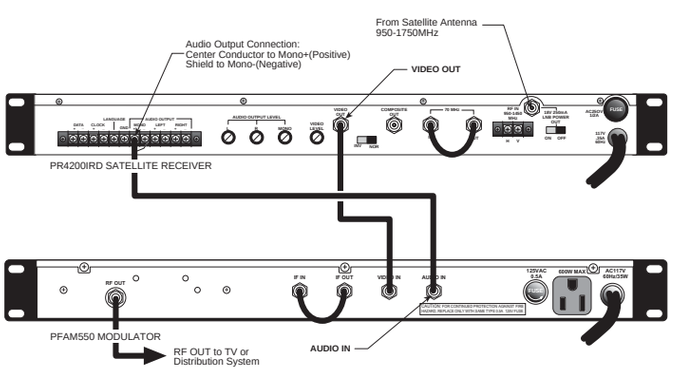
Installation

It is recommended that assistance be available to safely install equipment in equipment racks. Chassis must be fastened securely in equipment rack before populating with modules.

1. Install chassis in equipment rack (equipment rack sold separately) by supporting the bottom and rear of **PFAM550** at the desired elevation in rack.
2. Line up the side holes of chassis with the tapped equipment rack holes.
3. Insert the provided screws through the side holes in chassis and thread into the tapped equipment rack holes.
4. Fasten the bottom screws first, then fasten top screws (tighten securely).
5. Install a short F-type jumper cable (provided) between the IF output and IF input connector on the rear of the **PFAM550** (Required for proper operation).
6. Connect a cable from the output of the video source to the video input connector of the **PFAM550**.
7. Connect a cable from the output of the audio source to the audio input connector of the **PFAM550**.
8. Connect a cable from the output RF connector of the **PFAM550** to the input of the combining system.
9. Remove the channel select access panel on the front of the **PFAM550**.
10. Select the desired output channel by using a plastic screw driver to set the DIP switches using the included chart.
11. Connect power cord to receptacle supplying uninterrupted line power (LED on front panel will illuminate).
12. Connect a cable between the front panel output test point and a spectrum analyzer or signal level meter. Measure the video and aural carrier level.
13. Adjust the aural carrier level to 15dB below the level of the video carrier by slowly rotating the VIDEO AUDIO RATIO adjustment on the front panel of the **PFAM550**.
14. Connect a cable between the combining system test point and a spectrum analyzer or signal level meter. Measure the video and aural carrier level of the **PFAM550** and adjacent channels.
15. Adjust the Output level of the **PFAM550** to match the video and audio carrier levels of adjacent channels by adjusting the OUTPUT LEVEL adjustment on the front panel of the **PFAM550**.



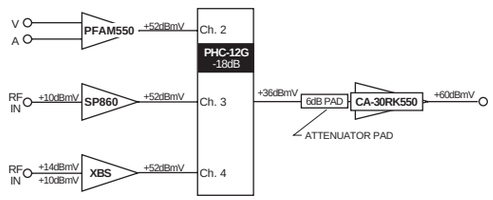
Signal Combining Methods

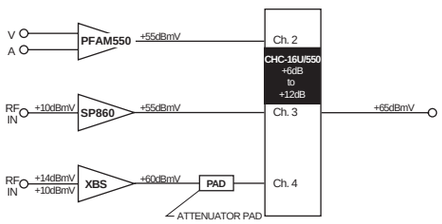
PICO MACOM recommends connecting the headend components in the following manner: Each of the modulators, signal processors or strip amplifiers output are connected to a combining network. Either a **PHC-12G** or a **PHC-24G** headend combiner may be used to accomplish this purpose.

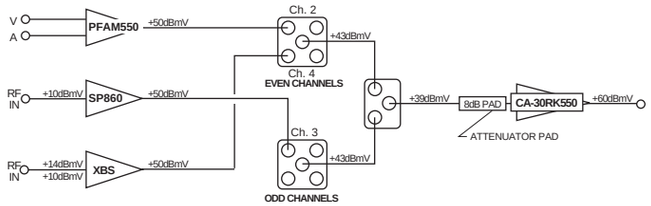
The **PHC-12G** or **PHC-24G** passive headend combiner consists of two rows of directional couplers combined by a hybrid splitter. Normally, the odd channels are combined on one row while even channels are combined on the other row of directional couplers for maximum isolation. The output of the combiners may be connected to the input of a launch amplifier such as a **CA-30RK550** or **CA-30RK1000**. The output of the amplifier is connected to the main distribution line.

The **CHC16U/550** and **CHC16U/860** sixteen channel active combiners provides both signal combining and post amplification of the headend signals. Up to 16 channels may be combined using the **CHC16U**. The combiner gain is 15 dB per channel.
A 24 channel system hook-up is shown. (The same combining result may be accomplished by using a single **PHC-24G**).

The two **PHC-12G** outputs are combined via a two-way splitter, which is connected to a **CA-30RK1000** launch amplifier. The input levels to the combiner, whether from a modulator, signal processor or a strip amplifier, must be at the same amplitude.







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PFAM550

Limited Warranty

Pico Macom warrants to the original purchaser that all of its new products are of sound design, quality materials and workmanship at the time of manufacture and will be free from related defects for one year from the original purchase date. Pico Macom will repair or, at its discretion, replace without cost to the original purchaser, the product which, upon inspection by Pico Macom, appears to be defective or not conforming to factory specifications. Pico Macom will cover the cost of parts, labor, and return freight from factory.

Five-Year Limited Warranty

Most products designated as "Headend Electronics" are further covered by an extended 4-year period beyond the expiration of the original 1-year warranty, for a full 5-year period. Qualified equipment requiring factory repair during the extended 4-year period is covered under our re-certification program. Re-certification fees under this program shall not to exceed 20% of the product's List Price and whenever possible, Pico Macom will attempt to upgrade performance to the latest improved specification.

Warranty Limitations

This warranty excludes coverage of damage or inoperability resulting from (1) use or installation other than in strict accordance with Pico Macom's written instructions, (2) disassembly or repair by someone other than Pico Macom or a Pico Macom authorized repair center, (3) misuse, misapplication or abuse, (4) alteration, (5) lack of reasonable care or (6) wind, ice, snow, rain, lightning, power surges, or any other weather conditions or acts of God. Pico Macom's warranty with respect to third-party proprietary sub-assembly modules and/or private-label products are limited to the duration and terms of third-party vendors' warranty. Pico Macom shall in no event and under no circumstances be liable or responsible for any consequential, indirect, incidental, punitive, direct or special damages based upon breach of warranty, breach of contract, negligence, strict tort liability or otherwise or any other legal theory, arising directly or indirectly from the sale, use, installation or failure of any product acquired by buyer from Pico Macom. This limited warranty extends to the original purchaser. Pico Macom reserves the right to modify or discontinue this warranty at Pico Macom's sole discretion without notification. No other warrantees are expressed or implied.

Uptime Loaner Program

Our Uptime loaner program is designed to provide domestic users of our headend products and commercial systems the best possible support and service. This program is established to minimize downtime resulting from equipment failure in critical service situations. We offer this program free-of-charge (excluding freight) to qualified purchasers within the warranty period. The program provides a free equipment loan of like qualified equipment enabling seamless operation for the time required to repair and return the unit.

The process is simple. Call our Customer Service desk requesting a return-merchandise-authorization (RMA) number for the failed equipment and ask for a loaner unit. We will issue an invoice for the List Price of the loaner unit plus shipping costs. When you receive the loaner unit, pack the failed unit in the loaner unit's box and ship it freight prepaid to Pico Macom for repair. When you receive the repaired unit, a new RMA number will be provided in the box. Carefully pack the loaner unit and affix the new RMA number on the box and ship it back to us for full credit excluding shipping costs.

To qualify for the program, you must have current open-terms with us and in good standing. We must receive your failed unit within one week after the loaner unit is shipped to you, and must likewise receive the loaner unit within one week after the repaired unit is shipped back to you. Daily rental fees not to exceed 10% of the equipment's List Price will apply beyond one week after the loaner or repaired unit are shipped to you. Other limitations may apply, so please call us for additional information on qualifying equipment and procedures. Pico Macom reserves the right to modify or discontinue the Uptime Loaner Program at any time, and at its sole discretion.

Damage or Shortage Claims

Our shipping staff carefully packs and ships your orders in compliance with common carriers' requirements. Please make note of any obvious damage or shortage on the freight bill or carrier's receipt next to your signature. The carrier's agent must too sign acknowledging the loss. Failure to do so may result in the carrier's refusal to honor the claim. Please open your order immediately upon receipt to check for concealed damage and compare the packing list to the items shipped. If damaged, keep the original shipping cartons for possible inspection by the carrier. You must report claims for loss or damage within 3 days of delivery, while claims for erroneous charges or price corrections must be presented within 30 days of invoice date.

Returning Shipped Items

To return any shipped items, including those shipped for warranty repairs or credit, call our Customer Service desk to request a Return Merchandise Authorization (RMA) number. Please reference the original invoice number and purchase date, and product serial number (if any). Be certain to mark the RMA number on the package boldly and legibly. Unless we specify a different carrier, please ship your returned items to us via UPS freight prepaid and fully insured. If returned for credit, we will promptly process your request upon receipt of your return order.

Our Return Policy: Your Satisfaction Guaranteed

Our goal is your complete satisfaction. If for any reason, our products were not quite what you anticipated, simply call your customer service rep and we will be happy to assist you in replacing or returning the order. You may return current, non-discontinued items for full credit for up to 30 days from invoice date. Our requirements are simple: Excepting defective items, the products must be returned in their original packaging and in re-salable condition. Restocking fees may otherwise apply beyond this period or if products are not returned in their original condition. Please contact your customer service rep for more information.

PICO MACOM 5 YEAR WARRANTY

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